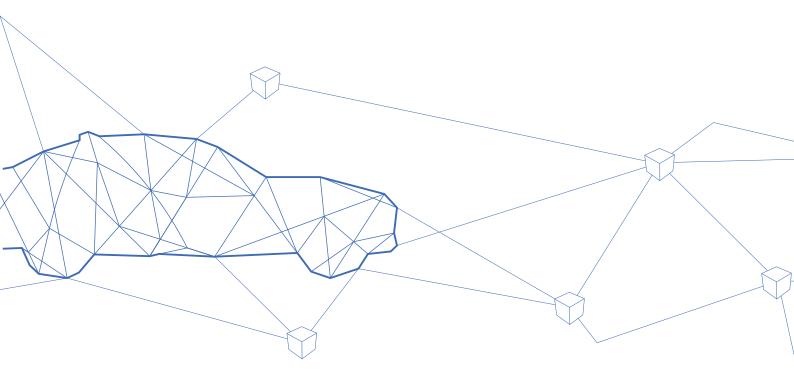
A Big Data Sharing System for Car Industry Based on Blockchain

## EngineChain White Paper





## CONTENT

Abstracts				
Statement				
Chapter One Engine Project Overview	4			
1.1 The Application Value of Blockchain Technology				
1.1.1 Engine's Vision and Mission				
Chapter Two Engine Business Planning 5				
2.1. Engine Vehicle Identification				
2.2. Engine Data Ecology	6			
2.3. Engine Landing Service				
2.4. Engine Project Planning	8			
Chapter Three Technical Introduction 9				
3.1. Engine Chain Structure				
2. Engine User System 1				
3. Engine Super Node11				
3.4. Engine Data Storage				
3.5. Engine Economic System	12			
3.6. Engine Consensus Mechanism				
2. Engine Technical Ground Floor				
3.8. Typical User Diagram	14			
Chapter Four Engine Governance				
Mechanism and EGCC Management				
Approach	16			
4.1. Governance Mechanism Description				
4.2. EGCC	17			
4.3. Duty of Disclosure				
4.3.1 Regular information disclosure				
4.3.2 Temporary Information Disclosure				
4.4. Legal Arrangements	18			
4.4.1 Legal Affairs				
4.4.2 Disclaimers				
Chapter Five Cornerstone Organization				
Chapter Six Version History19				
Chapter Seven Contact				

## Abstracts

Automobile is an important means of transportation for human beings. The safety, value preservation and disposal of the automobiles are related to the vital interests of owners. According to the statistics of the International Organization of Motor Vehicle Manufacturers and the Association of Automobile Manufactures, the current global car ownership has exceeded 1.2 billion, and various sub-sectors such as auto finance, transaction, repair, and maintenance are all trillion-level market.

For automobile manufacturers, service providers, and insurance companies, the vehicle data, vehicle conditions, and estimated value can be accurately quantified; however, for the average car owner, the car is a complex mechanical construct, the vehicle value assessment and vehicle condition analysis are not just time-consuming but cannot yield accurate conclusions. This is also a typical feature of the "lemon market". Information asymmetry, vehicle information arbitrarily tampered with, and the lack of credibility of vehicle value assessment agencies are the most typical characteristic of the "centralization" of the current car industry and the biggest bottleneck encountered in the development of the industry.

Under the premise of integrating the strongest data resources in the car industry, the automotive big data ecology built by Engine through blockchain technology can create an unchangeable lifetime digital file for each car. Based on this file, Engine can build a more just, transparent and decentralized automobile big data sharing ecology, thus providing consumers with common chain services such as car data query, vehicle condition tracking, value assessment, automotive finance and other sub-domains without trust costs, and fundamentally eliminating the automotive industry ecology centralization, information asymmetry, profit distribution links that are not open and transparent. Based on the shared ecology built by blockchain technology, Engine products can be extended to all aspects of the automotive industry, bringing the automotive field to a new era and becoming one of the core pillars of the future automotive industry.

This article will explain in detail how Engine uses blockchain technology to build automotive data ecology.

## Statement

Business models such as ideas, innovative models, technological means and proposed application scenarios in this project are all developed by the Engine team. This White Paper is intended only to provide potential project participants with the basis for decision-making with respect to participation, but not for any other commercial purposes.

Project participants referring to the White Paper shall keep relevant business secrets confidential and the Engine team reserves the right to prosecute offenders if there is any.

## **Chapter One Engine Project Overview**

#### 1.1 The Application Value of Blockchain Technology

If the Internet technology solves the communication method, blockchain technology solves the problem of mutual trust.

Blockchain technology is a non-centralized distributed database and intelligent peer-to-peer network that identifies, disseminates, and records information, also known as the Value Internet. It is currently being used to solve the industry barriers caused by the "centralization" brought about by information asymmetry, as well as related problems such as monopolistic profits and information fraud.

Blockchain technology will transform the storage and transmission of network data, thus opening a new era of trust economy.

#### 1.1.1 Engine's Vision and Mission

Engine is committed to developing into a global leading blockchain technology company. What we need to do is to make use of the blockchain as a core technology to build a robust and dynamic automotive data ecology, and give full play to the power of the whole society to maintain data, reduce the data cost effectively while solving data ownership and improving the efficiency, and enable global users to share and access data on an equal footing:

1. Data collection and sharing platform - Whether B or C users can share data, gain profits in uploading or trading, or they can search the platform for required data; using blockchain technology to solve data trust problem (do endorsements).

2. Give full play to the power of the whole society - The early stage is mainly the B-side client, but in fact it is a public chain. It is completely open to the C-side; the B-side can also have its own side-chain, and "enjoy the right, do its duty" in the side-chain. Awards to the ones who contribute and punishment to the ones who do evil.

3. Data ownership - Acquiescence given to the uploader to have the right to use data, and at the same time give different definitions for different data sidechains through smart

contracts and consensus, provide a variety of solutions to facilitate the different users and different data.

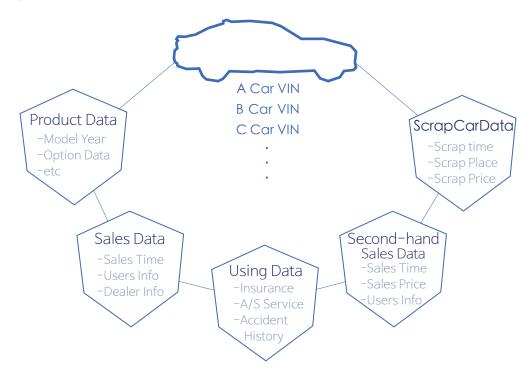
The above three points are effectively combined to form an "ecology"

## **Chapter Two Engine Business Planning**

#### 2.1. Engine Vehicle Identification

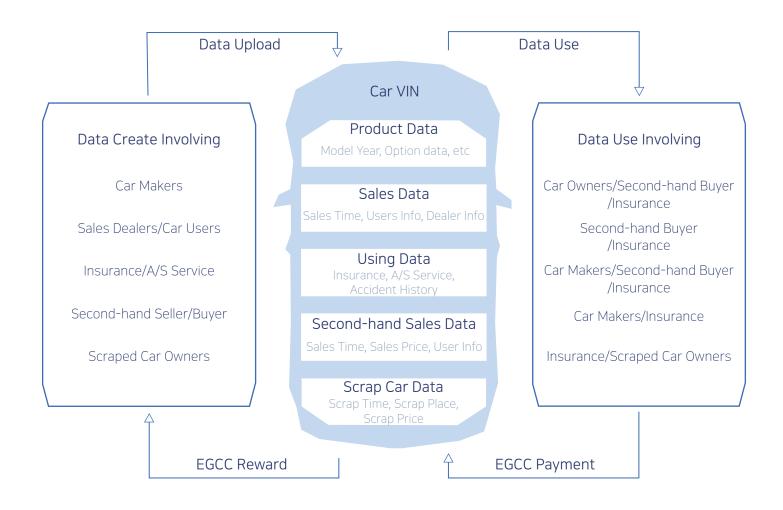
As the first global vehicle full life cycle data sharing platform based on the blockchain, Engine actively carrys forward the integration of informatization and industrialization, and promotes the sustainable development of the autoindustry through the realization of the open and transparent, traceable and queryable automobile life cycle data, to establish a "Vehicle Full Life Cycle Database based on VIN code" as the main line database, provides standardized data services for industry and enterprises, and to create a global car industry data standard.

The vehicle identification number, abbreviated as VIN, is a group of seventeen alphanumerics that are used on cars to create a unique set of numbers that can identify the car's manufacturer, engine, chassis serial number, and other properties.



#### 2.2. Engine Data Ecology

The goal of Engine is to create a set of auto data ecology on the blockchain, through pre-project scale data collection and precipitation, and put the data into products with blockchain as the underlying technology to activate the characteristics of the blockchain and transmit the value of information, thus reaching the user's pain points and solving existing problems. At the same time, individual users and corporate users are mobilized through the owner's service and the entire chain of products, urging people and organizations from all walks of life to participate in the joint development of value and rewards.



#### 2.3. Engine Landing Service

Based on the above concepts and the characteristics of decentralized, point-to-point transmission, traceability, tamper-proof, and data security of the blockchain, the Engine is designed to solve the pain points of the automotive industry, and plans to provide the following categories of business services: 1. The second-hand car trading - Due to the opaque vehicle information, buyers and sellers are highly asymmetric in information, especially the intentional information concealment of the sellers, which greatly affects the user's confidence in the second-hand car market and restrains the development of the second-hand car industry. Based on the transparent and tamper-proof nature of data in blockchain technology, Engine can maximally acquire data on vehicles from vehicle owners, 4S shops, maintenance centers, and authorized insurance agencies, and mutually verify the data uploaded by different users through the data validation system to ensure the truthfulness and accuracy of the final usable data, which can eliminate the fraud and rent-seeking behavior caused by information asymmetry in the second-hand cars that can greatly activates second-hand cars market transactions, promote industrial and service upgrading in the automotive industry.

2. Things related with auto rental - Based on the collected mass data of cars, Engine will establish a more professional and powerful financial evaluation model and risk control model to provide all-round services for auto finance services such as car leasing, mortgage, and loans, which will effectively complement the traditional auto finance. This will allow more people to obtain cars that are in line with their own consumption capacity through rational financial planning and help expand the auto market.

3. Car insurance - Through the blockchain + automotive hardware model, sensors are installed on the vehicle, data sensed are recorded in real time, through the blockchain's consensus mechanism and irreversible features, the accident data can be disclosed accurately when it is out of danger. It provides the effective basis for the insurance compensation, prevents the disputes between the insurance claims, improve the efficiency and accuracy of insurance claims, and at the same time address the occurrence of insurance fraud. At the same time, through data collection, it effectively marks the user's own driving behavior and provide more reliable basis for insurance companies to calculate insurance premiums, and can achieve the breakthrough and innovation of the insurance.

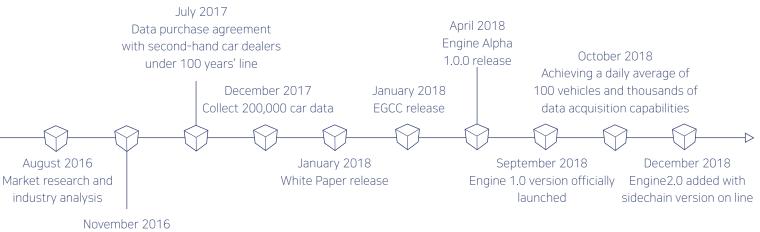
4. Auto parts - In the prosperous auto parts market, due to the refinement of the social division of labor, unlawful profiteers use information asymmetries and loopholes in the "production - supply – sales - consumption" process to obtain illegal profits and to bring rights and interests infringement between users and enterprises. Through the blockchain technology + Internet of Things model, the supply chain information of products can be effectively tracked, and the counterfeit goods in the auto parts market can be prevented

efficiently.

5. Car owner service - It provides traditional Internet services such as vehicle value assessment, car purchase calculator, fuel consumption calculator, driver's license checking and traffic violations inquiry.

#### 2.4. Engine Project Planning

From August 2016, Engine has been undergoing a full 13 months of preparatory work. In the past one and a half years, Engine has established a mature team with rich experience in online operations and the ability to lay down data channels offline. Engine test chain was released on-line in April 2018. At the same time, through continuous updates and iterations, the official mainchain is expected to be released in September 2018, and the first sidechain and corresponding applications will be released in December of the same year. By then, EGCC holders and ordinary users will be able to use EGCC to query car data on the platform. At the same time, Engine will also publish the industry leading business partner in the factory-installed product data source field, who are about to reach a strategic cooperation. At the data collection level, Engine has collected 200,000 relevant vehicle verses and added 100 vehicles and 1,000 data daily.



What we have done and what will be done form the following timetable:

Completion of a start-up team

## **Chapter Three Technical Introduction**

Based on the understanding of the existing technologies and the combination of Engine's vision of building auto data ecology, we have put forward alliance chains of different authorized user systems, and at the same time built main sidechain groups to meet the needs of different users in the ecology and the needs of different businesses.

#### 3.1. Engine Chain Structure

1. Chain Group Mode - In order to ensure the availability of the chain data, and significantly increase the data write rate (blockchain transaction processing speed is one of the important business considerations), scalability and different authorization management mechanisms, Engine uses the original "base chain + Eco-sidechain" chain group model to realize the interaction between the main and the sidechains, and build the data ecology through self-developed smart contracts, at the same time, support multiple chain expansion, which effectively increase the transaction rate, while promoting the construction of ecological mechanisms.

2. Mainchain - The mainchain is the ecological source of the chain group. Its importance is that it carries the principle consensus between the mainchain and sidechain (super node election, sidechain business model, etc.), records the main information of new vehicles, smart contract issuance, sidechains data snapshots, etc., facilitate the expansion of sidechains while avoiding over-inflation of mainchain data and improving the robustness of the blockchain.

3. Sidechain - Sidechain is the result of the evolution of data ecology. It is mainly divided into vehicle data sidechains, transaction sidechains, credit chains, and other functional sidechains. It has pluggable capabilities, and the number and types of sidechains can be adaptively scaled with business growth. The specific classification of sidechains is described as follows:

**Data sidechain**: Equipped with the value data of Engine, according to the different types of data sources, structure types, etc. It can be divided into four categories: basic vehicle information, raw materials, factory-installed products, and aftermarket-installed products. In spe-

cific, it can also be divided into parts, vehicles, distribution information (including second-hand car transactions), repair and maintenance data, insurance data, driving data, scrap data, etc. At the same time, the number of sidechains in the Engine system can be flexibly expanded to support different types of data that may arise in the future, thus forming full life cycle data of a car. Different types of data are stored in different chains, ensuring the sameness in their respective chains, and the different sidechains form the overall integrity and unity.

**Trading sidechain**: recording data transactions between users in the entire Engine ecology, ensuring the data sidechain's purity in data, supporting multi-joint expansion, and increasing the data transaction rate; at the same time, taking into consideration that use single-chain storage of the same user's consumption information to prevent the "double spending" of the currency.

**Credit sidechain**: Taking into account the effective development of the entire ecology, Engine uses an independent credit chain to record the credit performance of users throughout the ecology, ensuring the accuracy of the data itself and the feasibility of the transaction. Foundation, users or enterprise users can access the data through the credit sidechain data interface and process the data.

**Others**: With the development of Engine, new requirements and applications will be born; we will reserve multiple sidechains, such as the index chain after the data becomes huge, the independent rating chain of buyers and sellers, and the special data storage chain.

#### 3.2. Engine User System

Engine divides users into 3 types and gives them different permissions. For more convenient storage and usage in different scenarios, we store user data in a distributed database managed by the Foundation and at the same time build an authorization system to protect the entire Engine system.

1. Anonymous user - This is an unsigned guest in the Engine. In the anonymous state, the user can browse the basic data stored on the mainchain and the partially open data on the sidechain. In this mode, the user has no other rights.

2. Registered users - Only need to submit basic information to become a registered user.

Registered users have access to the basic data stored in the mainchain, as well as data open to registered users on the sidechain, and have two-way transaction data rights.

3. Business users - Business users are only open to companies that hold car industry documents. Business users need to submit relevant materials for public voting and certification. In addition to the rights of registered users, corporate users can compete for super nodes, and then enjoy super-privilege for maintaining sidechains.

#### 3.3. Engine Super Node

In order to ensure the orderliness and vitality of the entire ecology, Engine has also prepared super nodes for ecological partners. The super node not only enjoys the priority of book-keeping rights, but also has the right to participate in maintaining the data sidechain, corresponding to the obligation to fulfill the maintenance data, including setting standards, setting transaction standards and incentive mechanisms, desensitizing and privacy protection, and maintaining the authenticity of the data of this sidechain, etc., at the same tome enjoy the right of the profit of the corresponding side chain transactions, data ownership, and other rights.

First of all, the user obtains such rights through the unique super node voting mechanism of the Engine. When participating in the super node voting, it is necessary to establish the goals and business rules for maintaining the sidechain data. After the successful election, the Foundation will record corresponding information to the mainchain, and give the super node the corresponding rights through smart contracts.

#### 3.4. Engine Data Storage

Engine adheres to the following principles on the data storage:

1. Privacy protection - This privacy protection differs from the privacy protection of the user authorization management system. For highly confidential data and data concerning user privacy, the Engine only stores the HASH value of the data on the chain.

2. Structured - In addition to HASH data, the chain stores only strictly structured data to ensure data availability.

3. Capacity Feasibility - Large-capacity data, such as picture information, video information, etc., are stored according to the unique HASH method, which not only ensures that the data cannot be tampered with, but also prevents the disadvantages of infinite chain.

#### 3.5. Engine Economic System

1. Digital Assets - In the Engine planning project, it is tentative that only users holding EGCC have the right to trade the value data carried in the sidechain, and the users who upload the sidechain value data can also receive corresponding EGCC rewards after actual transactions occur.

2. Asset Migration - With the development of the Engine business, it is expected that in December 2018, the conversion of EGCC from the existing ERC20 public chain token to the Engine chain currency will start.

#### 3.6. Engine Consensus Mechanism

The consensus mechanism is the core technology of the blockchain. Engine supports algorithm pluggable method and stipulates the algorithms and protocols of the consensus process. In the case of multi-participation, the final agreement is reached according to the predetermined rules. Consensus algorithms mainly include DPOS, PBFT, and RAFT. Based on this, Engine forms the VDPOS algorithm (dynamically adjusts the authorization and interest certification mechanism). VDPOS can adjust the number of trusted agent nodes and support the entry and exit of trusted agent nodes. According to the historical performance of the data provided by the agent node, graded incentive is made according to pre-established rules to encourage agent nodes to provide high-confidence data and provide a sound development environment for the entire ecology.

#### 3.7. Engine Technical Ground Floor

Based on the principle of "safe, efficient, open and innovative", Engine technical ground floor is mainly composed of consensus mechanism, smart contract, sidechain management, network communication, and record storage, and monitors the entire Engine service throughout the entire life cycle. Each node can be deployed in a specified server cluster in a containerized operation mode through user configuration, and supports flexible expansion. The system automatically repairs fault nodes to ensure the reliability of blockchain applications.

1. Smart Contracts - Smart contracts are the soul of the blockchain. The Engine provides Turing-complete contract containers that support user-defined contracts, including contract registration, triggering, execution, and logout. Future plans support multilingual contracts. Currently trading and browsing as a key smart contract throughout the blockchain is the cornerstone of the entire data ecology.

2. Sidechain Management - Generally, the blockchain is mainly single-chain. Engine innovatively supports the multi-sidechain mode. The sidechain interacts with the mainchain through smart contracts. Before the creation, key information such as data structure, life cycle, and main maintenance side must be defined. The sidechain will greatly expand the entire engine's data storage capabilities.

3. Network Communication - Point-to-point network communication is responsible for the transmission of message data between nodes and services. Engine uses a dynamic, self-organizing network with multiplexing and connection sharing. It is compatible with existing security facilities such as firewalls and proxy servers to provide point-to-point networking, and secure and reliable data transmission.

4. Record storage - Data records use a blockchain structure. Any tampering with historical data can be found by self-verification. The storage medium supports a variety of methods, including databases, file systems, or cloud storage, where the file system conforms to standard file protocols. The database is mainly distributed KV database.

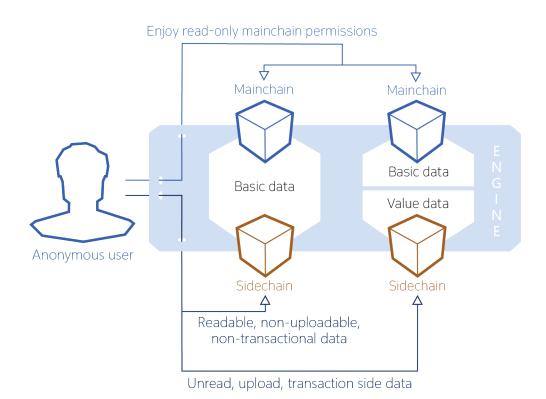
5. Interface Adaptation - Engine provides a variety of interface adaptations, including SDK packages and Restful APIs, for easy access to the blockchain. Users can use the above methods to invoke smart contract access blockchain systems.

6. Operation monitoring is responsible for the process of deployment, configuration

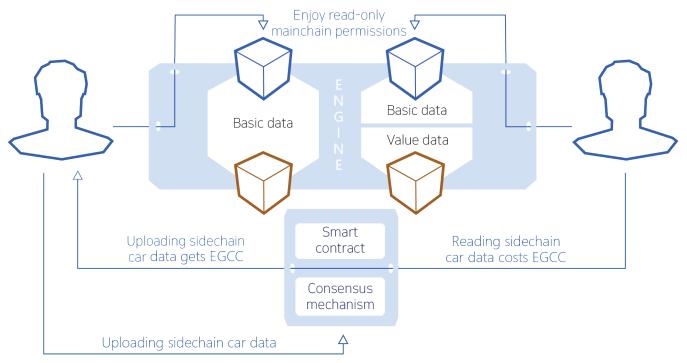
changes, contract settings, and the visual output of the status in blockchain operation, such as transaction volume, network status, and node status.

#### 3.8. Typical User Diagram

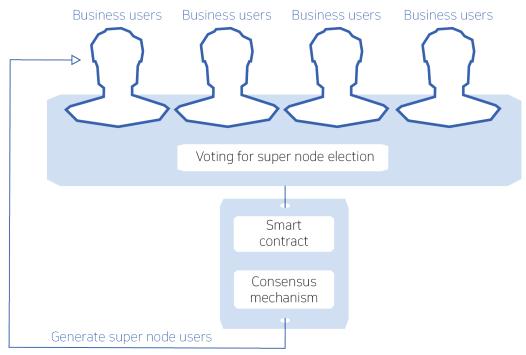
1. Browsing the car basic data: The user can view the basic data on the mainchain and some sidechains without logging in. The value data on the sidechain cannot be browsed, and there is no right to submit data and purchase data.



2. Report data and purchase data: After registering and logging in, the user can report data to the mainchain and the sidechain. If the value data reported has generated a transaction, the EGCC transaction award can be obtained. If you see the data you are interested in, you can also get value data by spending EGCC.



3. Enterprise users can participate in super nodes selection to gain super rights to maintain side-chains and formulate side-chain ecological rules.



# Chapter Four Engine Governance Mechanism and EGCC Management Approach

#### 4.1. Governance Mechanism Description

The three-level governance structure of the EGCC Holders' Assembly, Autonomous Committee, and Executive Committee consists of a Technical Committee, an Application Committee, a Finance Committee, a Legal Affairs and Risk Control Committee, and a Market and Public Relations Committee. The specific tasks of each department are as follows:

#### (1) Technical Committee

It is responsible for the technical management of Engine. The specific tasks include open source code management, code development, code modification, code testing, code review, code on-line, and bug fixes.

#### (2) Application Committee

It is responsible for application scene landing after the online of domainchain, upper chain data checking, information disclosure of upper chain assets, and upper chain assets exchange and management.

#### (3)Finance Committee

It is responsible for the use and review of BTC for the entire project exchange, project development, daily operations, staffing expenses and planning arrangements, etc.

#### (4) Legal Affairs and Risk Control Committee

Responsible for the registration of domestic and foreign companies, review various types of agreements, and give professional advice on legal affairs.

#### (5) Market and Public Relations Committee

The Market and Public Relations Committee mainly serves the blockchain community and is responsible for technology promotion, product promotion, commercial cooperation and external publicity.

#### 4.2. EGCC

EGCC is a native asset on the Engine blockchain. It is a value measurement of the digital mapping of physical automotive assets on the Engine blockchain. It is the only approved transaction value subject matter in the Engine system platform, and its value will increase with the development of Engine's entire ecology. On Engine, EGCC can be specifically used to exchange required car data queries, perform car valuations, publish information, etc.

The total amount of EGCC is fixed at 10 billion, and will never add up. The external issuance method is only exchange, and the proportion of exchange accounts for 40% of the total, that is, 4 billion EGCC. 35,000 Ethereums are planned to be exchanged. Promotional activities such as commercial operations take up 15%, i.e., 1.5 billion EGCCs. The project Foundation holds 25%, i.e., 2.5 billion EGCCs, and business expansion, data collection and other operating activities are reserved for 20%, i.e., 2 billion EGCCs.

#### 4.3. Duty of Disclosure

The designated website for information disclosure of Engine is its official website: egcchain.com.

#### 4.3.1 Regular information disclosure

Engine will prepare and disclose an annual report within three months from the first date of each fiscal year and disclose a quarterly report within two months from the end of each quarter. Such reports include, but are not limited to, milestones and progress of Engine's technology development, management of its digital assets, performance of the Engine Team, etc.

#### 4.3.2 Temporary Information Disclosure

The Engine Foundation should timely report major cooperation, changes to core team members, lawsuits involving Engine, etc.

#### 4.4. Legal Arrangements

#### 4.4.1 Legal Affairs

Founded overseas, the Engine Foundation should consult local lawyers in case of matters requiring legal advice.

#### 4.4.2 Disclaimers

EGCC donators shall understand that Engine will not make any express or implied warranties within the framework of the law and EGCC is given to donators on an "as is" basis.

Additionally, donators shall understand that in no case will Engine return the donations.

## **Chapter Five Cornerstone Organization**



## **Chapter Six Version History**

	Time	Version	Content changes
$\bigcirc$	June 24, 2017	V 1.0	Outline and framework
$\bigcirc$	July 6, 2017	V 1.2	Version of main application scenarios of car assessment
$\bigcirc$	July 17, 2017	V 1.3	Version of main application scenarios of second-hand cars
$\bigcirc$	July 28, 2017	V 1.4	Version of main application scenarios of second-hand cars
$\bigcirc$	August 4, 2017	V 1.5	Version of full industry chain application scenarios
$\bigcirc$	August 16, 2017	V 1.6	Version of full industry chain application scenarios (update of technical part)
$\bigcirc$	August 24, 2017	V1.7	Version of full industry chain application scenarios (exchange of digital assets)
$\bigcirc$	October 5, 2017	V1.8.2	Update to the latest technological framework
$\bigcirc$	December 17, 2017	V 1.9	Correction of IoV standard data set for factory-installed products
$\bigcirc$	January 10, 2018	V 2.0	Determination of early investors
$\bigcirc$	January 25, 2018	V2.1.7	Cornerstone investment institutions added
$\bigcirc$	May 4, 2018	V 3.0	Reconstruction

## **Chapter Seven Contact**

Website: www.egcchain.com

E-Mail: bd@egcchain.com